CLAIMS

1. System for switching packets comprising:

a plurality of input ports, including at least one non-addressable stream input port;

a plurality of non-addressable stream output ports;

a multiple port switch, connected between said non-addressable stream input ports and said non-addressable stream output ports;

said multiple port switch directing a packet, received from a selected one of said at least one non-addressable stream input ports, to at least a selected one of said at least one non-addressable stream output ports,

said multiple port switch selecting said selected non-addressable stream output port according to the type and identity of said selected non-addressable stream input port and the identity information embedded in said received packet.

2. The system according to claim 1, further comprising a priority controller, connected to said multiple port switch.

3. The system according to claim 1, further comprising at least one media degradation unit, each said at least one media degradation unit coupled to a selected one of said non-addressable stream output ports.

4. The system according to claim 1, wherein said at least one non-addressable stream input port is operative to receive MPEG transport packets.

5. The system according to claim 1, further comprising at least one addressable stream communication port, connected to said multiple port switch,

said multiple port switch directing a packet, received from a selected one of said at least one addressable stream communication ports, to at least a selected one of said at least one non-addressable stream output ports

6. The system according to claim 1, wherein said at least one addressable stream input port is operative to receive Ethernet packets or IP packets.

7. The system according to claim 1, wherein said selected non-addressable stream output port encapsulating said packet in a non-addressable stream packet, when said packet is received from one of said at least one addressable stream input ports.

8. The system according to claim 1, wherein said multiple port switch is an Ethernet switch.

9. The system according to claim 1, wherein said multiple port switch is a communication switch.

10. The system according to claim 4, wherein said MPEG transport packets are encapsulated into communication packets respective of the communication protocol of said multiple port switch.

11. The system according to claim 1, wherein said at least one non-addressable stream input port comprises a multiple program transport interface and wherein said at least one non-addressable stream output port comprises a multiple program transport interface.

12. The system according to claim 1, wherein said at least one addressable stream input port comprises a data input port.

13. The system according to claim 1, further comprising a plurality of stream processors, each said stream processor being connected between said multiple port switch and a respective one of said non-addressable stream output ports.

14. The system according to claim 13, wherein each said stream processors is operative to at least perform a procedure selected from the list consisting of:

multiplexing;

re-multiplexing;

rate adaptation;

PID re-mapping;

PCR re-stamping; and

updating system information embedded in transport streams.

15. Method for switching packets, the method comprising the steps of:

receiving a packet from an input port selected from at least one non-addressable stream input port;

selecting at least one of a plurality of non-addressable stream output ports according to the type and identity of said selected input port and the identity information embedded in said received packet; and

directing said packet to said selected non-addressable stream output port.

16. The method according to claim 15, wherein said input port is further selected from at least one addressable stream input port.

17. The method according to claim 15, further comprising the step of prioritizing the directing of the session associate with said received packet.

18. The method according to claim 16, further comprising the step of encapsulating said packet in a non-addressable stream packet, when said packet is received from one of said at least one addressable stream input ports.

19. The method according to claim 15, further comprising the step of encapsulating said packet in a addressable stream packet, when said packet is received from one of said at least one non-addressable stream input ports.

20. The method according to claim 15, wherein said non-addressable stream packet includes an MPEG transport packet.

21. The method according to claim 16, wherein said addressable stream packet includes a data packet.

22. The method according to claim 15, further comprising the step of stream processing said packet.

23. The method according to claim 22, wherein said step of stream processing said packet includes at least a procedure selected from the list consisting of:

multiplexing;
re-multiplexing;
rate adaptation;
PID re-mapping;
PCR re-stamping; and

updating system information embedded in transport streams.

24. Method for switching packets, the method comprising the steps of:

receiving a packet from an input port selected from at least one non-addressable stream input port;

when said packet is received from said at least one non-addressable stream input port, detecting identity information associated with said received packet, determining at least one destination port according to said identity information and embedding said packet in an addressable stream packet with a header directed to at least a selected one of said at least one destination port; and

directing said data packet to said destination port.

25. The method according to claim 24, wherein said input port is further selected from at least one addressable stream input port, the method further comprising the step of determining said received packet a data packet having at least one destination port when said packet is received from said at least one addressable stream input port, before said step of directing.

26. The method according to claim 24, wherein said identity information includes the identity of said at least one non-addressable stream port receiving said packet.

27. The method according to claim 24, wherein said identity information includes the identity of a media stream associated with said packet.

28. The method according to claim 26, wherein said identity information further includes the identity of a media stream associated with said packet.

29. The method according to claim 24, further comprising the step of stream processing said packet.

30. The method according to claim 29, wherein said step of stream processing said packet includes at least a procedure selected from the list consisting of:

multiplexing;

re-multiplexing;

rate adaptation;

PID re-mapping;

PCR re-stamping; and

updating system information embedded in transport streams.

31. The method according to claim 24, wherein said non-addressable stream packet includes an MPEG transport packet.

32. The method according to claim 25, wherein said addressable stream packet includes a data packet.

33. Broadband multimedia system comprising:

a communication bus;

a router, connected to said communication bus and further between a plurality of media sources and a plurality of network transmitters;

a session manager, connected to communication bus,

said session manager providing routing instructions to said router, for directing data received from said media sources to said network transmitters for transmitting over a broadband network.

34. The broadband multimedia system according to claim 33, further comprising a policy database, connected to said communication bus,

said session manager producing said routing instructions at least according to policy information retrieved from said policy database.

35. The broadband multimedia system according to claim 34, wherein said policy database includes at least general policy rules.

36. The broadband multimedia system according to claim 34, wherein said policy database includes at least network policy rules.

37. The broadband multimedia system according to claim 33, further comprising a bandwidth utilization detection unit, connected to said communication bus,

said session manager producing said routing instructions at least according to bandwidth utilization information received from said bandwidth utilization detection unit.

38. The broadband multimedia system according to claim 33, further comprising a network management system, connected to said communication bus,

said session manager producing said routing instructions at least according to bandwidth network management information received from said network management system.

39. The broadband multimedia system according to claim 33, further comprising a dynamic network restructuring unit, connected to said communication bus,

wherein said network transmitters are further connected to said communication bus,

wherein said dynamic network restructuring unit provides channel managing commands to each said network transmitters, receiving data from said router.

40. The broadband multimedia system according to claim 33, wherein said session manager receives a plurality of session requests, for executing a session through said broadband multimedia system, said session manager either allows or denies each said session requests, said session manager provides resource allocation parameters for each said allowed sessions.

41. The broadband multimedia system according to claim 33, further comprising an RF switch, connected to said communication bus and further between said network transmitters and a plurality of RF combiners,

said RF switch directing RF signals from selected ones of said network transmitters to selected ones of said RF combiners.

42. The broadband multimedia system according to claim 41, further comprising a dynamic network restructuring system, connected to said communication bus,

said dynamic network restructuring system providing switching commands to said RF switch for directing said RF signals.

43. The broadband multimedia system according to claim 33, wherein at least selected ones of said network transmitters are QAM units.

44. The broadband multimedia system according to claim 33, wherein said broadband network is an HFC network.

45. The broadband multimedia system according to claim 33, wherein said broadband network is a DSL network.

46. The broadband multimedia system according to claim 33, wherein said broadband network is a satellite network.

47. The broadband multimedia system according to claim 33, wherein said broadband network is a wired network.

48. The broadband multimedia system according to claim 33, wherein said broadband network is a wireless network.

49. Network session management system comprising:

a session manager, coupled to at least one application manager, and

at least one policy database,

said session manager receiving session requests,

said session manager denies a selected one of said session requests when detecting non-compliance of said selected session request with at least a selected policy rule retrieved from said at least one policy database.

50. The network session management system according to claim 49, further comprising a shared area manager, coupled to said session manager,

said shared area manager producing a session denial indication when detecting non-compliance of said selected session request with predetermined shared area policy rules.

51. The network session management system according to claim 50, further comprising a dynamic network restructuring unit, coupled to said shared area manager,

said dynamic network restructuring unit producing a session denial indication when detecting that the bandwidth required in said session request is greater than available network bandwidth.

52. The network session management system according to claim 51, wherein said network restructuring unit determines network resources to session request session denial indication when detecting that the bandwidth required in said session request is greater than the available network bandwidth.

53. The network session management system according to claim 52, wherein said session manager authorizes said selected session request when detecting compliance with said selected policy rules retrieved from said at least one policy database and receiving a session approval indication from said shared area manager,

said session manager further assigning said determined network resources to said session request and available network bandwidth.

54. The network session management system according to claim 49, wherein said session manager is further coupled to an out of band manager, said session manager receiving at least one of said session requests from said out of band manager.

55. The network session management system according to claim 49, wherein said at least one policy database is selected from the list consisting of:

a general policy database;

a network policy database;

a sub-network policy database;
a target policy database; and
an external application policy database.

56. The network session management system according to claim 49, wherein said session manager is further coupled to additional information resources,

said session manager denies a selected one of said session requests when detecting non-compliance of said selected session request with at least a selected parameter retrieved from said additional information resources.

57. Method for managing sessions, comprising the step of denying an init-session request when detecting non-compliance of said init-session request with at least one general policy rule.

58. The method according to claim 57, further comprising the step of authorizing said init-session request when said init-session request is not denied.

59. The method according to claim 57, further comprising the step of denying said init-session request when detecting non-compliance of said init-session request with at least one network policy rule.

60. The method according to claim 59, further comprising the step of authorizing said init-session request when said init-session request is not denied.

61. The method according to claim 59, further comprising the step of denying said init-session request when detecting non-compliance of

said init-session request with at least one bandwidth usage policy rule.

62. The method according to claim 61, further comprising the step of authorizing said init-session request when said init-session request is not denied.

63. The method according to claim 61, further comprising the step of denying said init-session request when detecting that said init-session request requires channels and bandwidth resources which are greater than the available channels and bandwidth resources.

64. The method according to claim 63, further comprising the step of authorizing said init-session request when said init-session request is not denied.

65. The method according to claim 63, further comprising the step of assigning at least one channel and bandwidth within said at least one channel to said init-session request when said init-session request is not denied.

66. The method according to claim 65, further comprising the step of launching a session associated with said init-session request.

67. The method according to claim 66, wherein said step of launching comprises the sub procedures of:

operating an input module receiving said session, according to approved session information;

operating a switching module switching said session, according to approved session information;

operating at least one output module through which said session is to be directed, according to approved session information.

68. Method for managing sessions at a shared area level, comprising the step of denying an init-session request when detecting non-compliance of said init-session request with at least one shared area session policy rule.

69. The method according to claim 68, further comprising the steps of:

determining if the bandwidth requirement of the session associated with said init session request, is no greater than the available bandwidth within channels of said shared area;

detecting an additional channel to be assigned to said shared area when said bandwidth requirement are greater than the available bandwidth within said channels of said shared area; and

denying an init-session request when said additional channel can not be detected or when said additional channel can not be added to said shared area.

70. The method according to claim 69, further comprising the step of assigning an optimal channel to said shared area, from channels of said shared area network.

71. The method according to claim 70, further comprising the steps of:

providing session parameters to a channel manager operating said assigned channel;

detecting a channel readiness information provided by said channel manager; and

denying said session when said channel readiness information includes a channel non-readiness indication; and

approving said session when said channel readiness information includes a channel readiness indication.

72. Method for dynamic network restructuring, comprising the steps of:

denying an init-session request when the bandwidth requirement of a session associated with said init-session request, is greater than the available bandwidth within said shared area; and

denying said init-session request when the channel equipment requirement of said session, is unavailable within said shared area.

73. The method according to claim 70, further comprising the step of allocating channel and bandwidth for said session.

74. The method according to claim 71, further comprising the step of denying said init-session request when the RF equipment requirement of said session, is unavailable RF equipment within said shared area.

75. The method according to claim 74, further comprising the step of determining an RF route for said session.

76. The method according to claim 74, wherein said step of determining said RF route for said session is performed by hardware switching.

77. Packet switch system comprising:

a packet switch engine;

a downstream re-multiplexing engine, coupled to said packet switch engine and to a plurality of downstream transmit units; and

a plurality of media-access controllers coupled to said downstream re-multiplexing engine, said packet switch engine and to upstream channels,

said media-access controllers provide packets received from said upstream channels either to said downstream re-multiplexing engine or to said packet switch engine, according to packet content type and packet original destination.

78. The packet switch system, according to claim 77, further comprising an upstream switch coupled between said media-access controllers and said upstream channels,

said upstream switch dynamically directing packets from selected ones of said upstream channels to selected ones of said media-access controllers.

79. The packet switch system, according to claim 77, wherein said packet switch engine is further coupled to a data network.

80. The packet switch system, according to claim 79, wherein said data network is an IP network.

81. The packet switch system, according to claim 77, wherein said downstream transmit units are further coupled to a broadband network including in-band channels and out-of-band channels,

wherein said packet switch engine is further coupled to said out-of-band channels via a data link.

82. The packet switch system, according to claim 81, wherein said data link comprises an IP interface.

83. The packet switch system, according to claim 77, further comprising a rate adaptation statistical multiplexor engine, coupled to said packet switch engine.

84. The packet switch system, according to claim 77, further comprising a processor, coupled to said packet switch engine.

85. The packet switch system, according to claim 83, further comprising a processor, coupled to said packet switch engine.

86. The packet switch system, according to claim 85, wherein said processor is operative to determines and controls the load balancing between competing communication elements and provides parameters there according, to said downstream re-multiplexing engine, said rate adaptation statistical multiplexor engine and said media-access controllers.

87. The packet switch system, according to claim 85, wherein said processor is operative to determine transmit priority to each session transmitted trough said downstream re-multiplexing engine, detect over all transmit load and control the transmitting order and quality of said sessions.

88. Method for directing a packet in a communication switching system, comprising the steps of:

rate adapted multiplexing said packet, over data-over-broadband network transmission, when said packet is a part of a media session over data-over-broadband network transmission, authorized for rate adaptation multiplexing; and

rate adapted multiplexing said packet, over media-over-broadband network transmission, when said packet is a part of a media session over media-over-broadband network transmission, authorized for rate adaptation multiplexing.

89. The method according to claim 88, further comprising the step of multiplexing said packet, over media-over-broadband network transmission, when said packet is a part of a media session over media-over-broadband network transmission, not authorized for rate adaptation multiplexing.

90. The method according to claim 89, further comprising the step of encapsulating said packet and re-multiplexing said encapsulated packet for further transmission, when said packet is directed to a non data-over-broadband network transmission end unit, supporting in-band channels.

91. The method according to claim 90, further comprising the step of directing said packet to an out-of-band channel, when said packet is directed to a non data-over-broadband network transmission end unit, not supporting in-band channels.

92. The method according to claim 91, further comprising the step of directing said packet to a selected media-access controller and further re-multiplexing said packet for further transmission, when said packet is directed to a cable modem.

93. The method according to claim 92, further comprising the steps of:

determining a packet destination according to session management determination or external network resources;

directing said packet to said packet destination when said packet destination is determined; and

discarding said packet when said packet destination can not be determined.

94. The method according to claim 88, further comprising the steps of:

assigning priority to each session associated with a received packet;

detecting transmit system load;

controlling said session transmit order and quality according to said detected transmit system load.

95. The method according to claim 88, further comprising the steps of:

assigning priority to each session associated with a received packet;

detecting transmit system load;

controlling said session transmit order and quality according to said detected transmit system load.

96. The method according to claim 88, wherein said media-over-broadband network transmission includes MPEG transport.

97. The method according to claim 88, wherein said data-over-broadband network transmission includes data-over-cable (DOCSIS) transmission.